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**WEAPONS OF MASS DESTRUCTION**

**BY**

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USAWC STRATEGY RESEARCH PROJECT

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LTC Michael W. Ryan

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## ABSTRACT

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The policy of mutual destruction limited the use of weapons of mass destruction (WMD) during the Cold War but has much less significance in today's global environment not only because of multiple regional instability and motivation to acquire, but also increased availability of resources and technologies to build WMD. Proliferation of weapons of mass destruction is a preeminent security threat in the 1990's. The US has policies and strategies to stem WMD proliferation and to counter the effects of their use. This paper will identify ways to deter threats of WMD against the United States through counterproliferation strategies of counterforce, active defense, and passive defense. Discussion includes aspects which challenge US interests and place greater burden on policymakers. These include politics, economics, technology and the global mindset.

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## WEAPONS OF MASS DESTRUCTION

The proliferation of weapons of mass destruction (WMD) is the preeminent security threat in the 1990s. This study identifies ways to deter or defeat threats of WMD against the United States through a counterproliferation strategy based on three interrelated concepts: a) counterforce, b) active defense, and c) passive defense. Discussion will include threats which challenge US interests and place greater burden on policy-makers and strategists.

### What Are Weapons of Mass Destruction?

Weapons of Mass Destruction (WMD) are officially defined as:

"nuclear, biological and chemical weapons employed for the purpose of inflicting massive damage, including the killing of large numbers of civilians. The term consolidates nuclear, biological, and chemical weapons into one category because, despite differences in their effects and use, they share enormous lethality and symbolism. Thus, the concept of WMD is significant in a political rather than a military sense. By using the term 'WMD', policy-makers convey the message that the proliferation of these types of weapons is unacceptable and that their use would be considered an extremely grave matter."<sup>1</sup>

Nuclear, chemical and biological weapons have all come to be regarded as WMD, but the effects of each are very different. Nuclear weapons utilize atomic energy. They destroy by blast,

thermal and nuclear radiation, and flying debris. Only nuclear weapons destroy comprehensively -- equipment, facilities and personnel. Biological agents are disease-causing microorganisms. They can be synthetic productions or living organisms. Poisonous or chemical agents incapacitate, injure or kill people. They attack the skin, eyes, lungs, blood, nerves or other organs.<sup>2</sup>

Without a means of delivery, agents of mass destruction are not very menacing. To pose an effective threat, each agent must be integrated into some type of weapons system. In today's arsenal, ballistic and cruise missiles and conventional aircraft provide the most common delivery systems.

#### Background

The "end of the Cold War ... hastened a restructuring of the international political system ... and changed the face of war."<sup>3</sup> Instead of two superpowers and a relatively clear concept of the "threat(s)", the world faces the volatility and potential instability of multiple and simultaneous regional conflicts - perhaps in Northeast Asia, the Middle East and North Africa, the former Soviet Union, South Asia, and various transnational threats (terrorism, insurgencies). Beyond such regional challenges, there is a great underlying uncertainty about exactly "who, what, when, or where" the "threat" is.

Simultaneously, more countries have WMD capabilities in varying stages of development. The likelihood of these countries actually using WMD is correspondingly greater than ever. Regional instability and the potential for regional wars compounds and increases this likelihood.<sup>4</sup> To further complicate matters, "modern technologies and the ever-increasing flow of goods, information, and people across national borders continues to place the deadly capabilities of WMD in many more hands, including those of unstable Third World countries."<sup>5</sup> These Third World countries are forging relationships among themselves, which decreases their dependency upon other industrialized nations such as the US for technical assistance in developing WMD.

At the same time, the United States National Security Strategy has as a major objective in the prevention of proliferation of weapons of mass destruction. Yet, total prevention of the proliferation of WMD is not feasible. Therefore, an effective and clear counterproliferation strategy comprised of counterforce, active defense, and passive defense is required to deter the use and minimize the effects of WMD to ensure US national security. Although the days of madness may have passed, once again the US is seeking ways to deter any nation's or party's first use of WMD.

The US must demonstrate global leadership by making proliferation and counterproliferation a national priority, not

only in terms of written policy, but by enacting that policy with the political and financial support it requires. This support, or lack of it, has not only national but international ramifications.

At least 20 nations, including Third World countries, have or are in the process of obtaining capabilities to build, manufacture, or utilize weapons of mass destruction. These capabilities include missile systems and other high technology delivery systems. These nations have several reasons for investing in WMD capabilities: to counter threats to homeland security; to develop a safe means of security; to project power regionality; to deter or counter great power influence or intervention; and to gain status as a global power.<sup>6</sup> Perhaps these are justifiable intentions. Nonetheless, many governments want WMD capability for more devious reasons - such as political leverage, regional hegemony and aggression, and propensity to be force multipliers.<sup>7</sup>

Technology and resources for manufacturing weapons are readily available to nations seeking to start production of their own WMD arsenal. There are some safeguards to prevent information getting into the wrong hands, but the bottom line is that "technology can be bought off the shelf, and other knowledge can be acquired through world-wide computer networks."<sup>8</sup> "Dual-purpose" technology (used for commercial and military purposes)

is more available, easier to obtain, and more likely to be used in covert operations, such as building missiles or chemical weapons. This duplicity causes strategic military problems in terms of detection of production, laboratories, and storage sites.

Biological and chemical agents are the cheaper and easier weapons to produce and use than nuclear weapons. Also, they are extremely lethal. Nuclear weapons are the most difficult to obtain because of costs, resources required, and possibility of discovery.<sup>9</sup> The potential for covert chemical-biological actions further enhances the need for a plan to counter proliferation of WMD and to anticipate problems that might occur when they are used.

#### Counterproliferation Strategies

Counterproliferation is "a coherent strategy to prevent countries from acquiring weapons of mass destruction through non-proliferation regimes, export controls, and political persuasion, or, should our efforts to prevent the acquisition of these weapons fail, to deter or destroy them prior to their use against our forces or to reduce their military effectiveness should they be used."<sup>10</sup>

Effective counterproliferation strategies are "seamless and interdependent."<sup>11</sup> They offer a continuum of options from prevention (nonproliferation) to protection (counterproliferation). The strategies include prevention, compellence, and deterrence which support prevention and nonproliferation. At the other end of the spectrum, they include counterforce, and active and passive defenses which support protection and counterproliferation. These strategies are central to National Security and National Military Strategies. They are executed through the interagency processes and coordination.<sup>12</sup>

In 1995, the US armed forces were assigned counterproliferation of WMD as a military mission. Counterproliferation strategies affect every defense mission. At the policy level, "counterproliferation measures are now routinely addressed in the Department of Defense planning and programming processes ... Military planning, training, and exercises now give much more emphasis to proliferation when potential major regional contingencies are addressed ... Proliferation protection requires a broad range of capabilities, including effective strategic and tactical intelligence; counterforce; active defense; passive defense; and response to paramilitary covert and terrorist threats."<sup>13</sup>

### Counterforce

Counterforce principles operate at all levels of military conflict and engagements. Counterforce refers to the ability to strike an enemy's forces before those forces can inflict damage. Counterforce as a strategic concept has your forces strategically preempting a full range of enemy targets before they can mobilize or deploy to attack your forces (and allies). Tactical preemption (counterforce) is the ability in war to find and attack deployed enemy forces before they can strike you. For example, an enemy's artillery and logistical capabilities may be targeted before the enemy can deliver chemical or nuclear weapons to the field.<sup>14</sup> "This component of counterproliferation involves development of military capabilities to target (using battlefield surveillance and other intelligence assets), plan attacks, seize, disable, destroy, disrupt, interdict, neutralize, or deny use of NBC weapons and launch platforms and their supporting command, control and communication."<sup>15</sup>

Current counterforce strategies rely in part on our efforts to improve sensors; to integrate collateral effects; to improve weapon effects and target responses; to develop advanced weapons, warheads, and munitions for neutralization of chemical and biological agents; and to develop means of destroying underground facilities.<sup>16</sup> Specifically, DOD is working to improve the

"capabilities to detect, identify, and characterize Nuclear, Biological, and Chemical forces and associated infrastructure elements in a timely manner to support targeting, mission/strike planning, and post-strike battle damage assessments (BDA). Emphasis is being placed on continuous wide-area surveillance; detection of mobile targets (particularly NBC-armed mobile missile launchers) and improved BDA capabilities. DOD is also enhancing capabilities for the integration and analysis of sensor inputs. These capabilities are required to provide the data needed to support attacks in the often very limited time windows available before mobile targets move from previously identified locations."<sup>17</sup>

One of the most compelling lessons from the Gulf War identified the difficulty of finding and destroying mobile and underground targets. The US needs to "improve capabilities for the identification, characterization, that is, accurate information concerning the locations and distinguishing traits or qualities of NBC related facilities, and defeat of underground and mobile targets because proliferates are increasingly making use of underground facilities as they respond to the demonstrated effectiveness in the Gulf War of US precision conventional munitions."<sup>18</sup>

Other efforts to improve counterforce operations include obtaining weapons "capable of penetrating through walls and other barriers that provide protection for above- and below-ground structures." We are also developing munitions to defeat NBC agents and targets, as well as weapons systems to defend against and defeat air and missile defense systems.<sup>19</sup>

Counterforce operations depend upon successful acquisition plans, policies and funding. Less and less money is spent for defense. The US currently faces a major obstacle in obtaining the best and necessary technology to protect and serve US interests.

Although counterforce is largely a unilateral capability, allies either approving or cooperating with the United States may have significant affects on the initiation and outcome of counterforce operations. Considerations by US policy-makers must include having a clear and limited policy for the sharing of our knowledge and technology, even with our allies. Given the global economic and political environment today, many factors affect decisions behind the planning and directing of the operations and US capability to preempt use of weapons of mass destruction. To keep the preemptive edge, our strategies must not be comprised in any way.

Future successful counterforce capabilities depend upon the US ability to stay on top of the technological game. Staying on top involves defining and establishing parameters for sharing our knowledge and technology. We must also maintain and upgrade our present store of arms and equipment; we should not dismantle it. Without strong military and technological superiority, US counterforce capabilities could become compromised.

Another means of staying on top and developing effective counterforce capabilities is to succeed economically. Some nations are beginning to surpass the US both economically and technologically, thereby threatening the world's remaining "superpower." The US must successfully budget and ride the tides of changes in the world economy, because US leadership of the global economy directly impacts military and technology superiority and ultimately US security.

Accurate and timely information from intelligence sources is critical in counterforce operations. Effective management and coordination of this intelligence support is equally important. This information is essential as input to military planning and operations as well as to research, development and fielding of equipment and updating weapons and munitions.

The US must also monitor all the "hot spots" (regional conflicts) in the world today and keep up with the massive amount of information required and collected by intelligence sources to support this task. Does the US have the required intelligence personnel and resources to handle this enormous task? What training is necessary? What impact do economics, technology, and the military have on this task? How does this information play into WMD policy? How do we manage this in the future?

Information management involves more than gathering "intelligence." It involves knowledge of and information on new

and developing technology and managing the ever-increasing mountain of general information collected just to run the government and create government policy. It also includes the ability to get that information to the field (i.e., for military operations or military defense) in a timely fashion.

The potential enemy's means of delivery of WMD has significant impact on counterforce operations. "There are no technological barriers preventing Third World countries from developing or purchasing the relatively inexpensive, potentially very accurate delivery systems."<sup>20</sup> The most common delivery systems are ballistic and cruise missiles and conventional aircraft. Of these, cruise missiles are the least expensive to obtain, the most accurate, and the least vulnerable to US offensive operations.

"As ballistic and cruise missiles become more available to emerging powers, the need for active defense becomes clearer. Low-observable cruise missile technology and missiles with long range capabilities decrease counterforce options for total success."<sup>21</sup> In the event counterforce operations are ineffective, active defense measures are the next resort in countering WMD.

### Active Defense

Active defense provides the ability to prevent surviving weapons from reaching their intended targets. "This facet of counterproliferation involves programs that improve capabilities to detect, track, identify, intercept and destroy, and neutralize NBC warheads delivered by airborne launch platforms, ballistic missiles and cruise missiles, while minimizing collateral effects."<sup>22</sup>

Missile intercept capability continues to be a priority for the Commander in Chiefs' (CINC's) military planning and operations. Although the US has the ability to determine where a missile launches from and when it is fired, we have very little capability to actually intercept that missile before it can inflict damage.

"The Gulf War experience convinced the US defense community of the military and political utility of having an effective theater ballistic missile defense."<sup>23</sup> According to a SECDEF report, "during the Gulf War, the US and its coalition partners were unable to locate Iraq's mobile launchers and halt ballistic missile attacks. Ballistic missiles - coupled with NBC weapons - will pose an even greater threat to US security and that of allies and other friendly nations. To effectively counter such threats, a layered defense is optimal, with effort being made to

attack prior, at, or immediately after launch so that NBC warhead debris and contamination do not land on friendly territory or troops."<sup>24</sup>

Active defense also relies upon command, control, communication, computer and information (C4I) and strategic warning capabilities.<sup>25</sup> Basically, C4I provides the ability to decipher information and get it to where it is needed in a timely and accurate fashion. Counterforce is dependent on intelligence sources and their ability to discriminate and target.

Strategic warning also provides the ability to acquire information about the enemy's intentions with sufficient lead time to respond effectively. "Particular emphasis has been given to providing increased warning time before potential adversaries translate technological potential for proliferation into operational NBC weapon capabilities."<sup>26</sup> The US "requires more accurate wide-band radar sensors to detect ballistic missiles."<sup>27</sup> As discussed under 'Counterforce', efforts are under consideration to improve and acquire new sensor capabilities. The role of sensors in the strategic warning strategy is but one example of the "seamless and interdependent" nature of counterproliferation strategies.

One of the major challenges for US active defense capabilities is the ability to respond simultaneously to multiple

regional aggression and threats to the US. The efficient disbursement of all necessary resources to prevent the "enemy's" weapons from reaching their intended targets is a key capability in the event of simultaneous major conflicts. A single-response capability may not suffice.

The seamlessness and interdependence of effective counterproliferation strategies are not easily acquired: "counterforce principles operate at all levels of military conflict and engagement."<sup>28</sup> Therefore, counterforce and active defense capabilities and passive defense must be integrated into a synchronized, well-conceived system. The choice of counterproliferation strategy, albeit counterforce or active defense, will depend upon the scenario(s) at hand. Timing of events will determine when and if active defense measures are appropriate. If the "enemy" delivers a WMD, then the US will respond by using its active defense strategy to stop the weapons from reaching their targets. At the same time, counterforce strategies will call for striking the rest of the enemy's forces to prevent further aggression.

Means of delivery affects active defense operations. Ballistic missiles are the most numerous. They are increasingly of better quality: they travel longer distance; they are more accurate, more mobile and more difficult to detect. Some missiles have the ability to elude US counterforce operations.

The US needs more advanced systems to track and destroy, while minimizing effects of the WMD. Also, the US lacks a missile defense program with sufficient quantity, quality and updated missiles and other relevant technology to provide even minimal US security protection.

Three missile defense systems currently being developed are the PAC 3, THAAD, and the AEGIS/SM. The PAC 3 is the Patriot Advanced Capability, a point or limited-area defense system. PAC 3 improvements include upgrades to radar and an improved hit-to-kill missile known as ERINT. Operational proto-type should be in use in the late 1990's. The THAAD is the Theater High-Altitude Area Defense, a ground-based theater missile defense (TMD) system that will provide a wide-area defense capability by intercepting longer-range theater-ballistic missiles at higher altitudes and at greater distances. It provides upper-tier defense to complement point defense, such as the Patriot. Operational proto-type should be in use in early 2000. The AEGIS/SM-2 Block IVA is the Navy lower tier which could provide tactical ballistic-missile defense capability similar to PAC 3 from the sea. Operational proto-type should be in use in the late 1990's.<sup>29</sup>

Likewise, the US faces many future challenges for an effective active defense. First, the United States needs a national missile defense system. This system must prepare for

attack against American territory. Also, the US needs the newest and best high-tech weapons to take out enemy WMD as close to the point of origin as possible. We need not only the technology and know-how to detect WMD, but also the weapons to intercept and destroy incoming missiles. The US needs to continually monitor and modify its "layered defense" plan, which must be supported with sound and constantly upgraded doctrine.

To sustain an active defense against WMD, the US must have the capability to defend simultaneously against multiple aggressors. This defensive strategy must incorporate the layered defense plan and use the acquisition process to ensure a more than adequate arsenal of defense capabilities. On a policy level, the US must develop options for dealing with the international political ramifications of US retaliatory measures against a government who uses WMD against either the US or a coalition force, a friend or ally. These options must provide for dealing with where the WMD was "taken out" and the fallout of that action, such as retaliatory strike and collateral damage, and other second or third order effects of preemptive and interceptor actions.

Ideally, the US wants to prevent use of WMDs. "Passive defenses that allow sustained combat and logistical operations in the face of attacks by NBC weapons and their delivery systems are among the best ways to dissuade proliferents from acquiring or

using WMD."<sup>30</sup> But when counterforce and active defense measures fail, and WMD weapons are utilized, it is imperative that US and allied forces can sustain and complete their mission in spite of the NBC environment. A strong and effective passive defense program allows for sustainment of operations.

#### Passive Defense

"Passive defense involves military capabilities that provide protection against NBC weapon [attacks and] effects. Passive defense programs involve contamination avoidance (reconnaissance, detection, and warning), force protection (individual and collective protection and medical support) and decontamination."<sup>31</sup>

This defense is achieved by various means, from protective masks to equipment of larger systems allowing operation in chemical, biological, and limited nuclear environments. Theoretically, passive defense provides a strong deterrent: a WMD user will be discouraged knowing US forces are able to operate in chemical and/or biological environments. If the WMD fails to defeat an opponent, then the opponent may retain the means to destroy the user without fear of being regarded as a merciless aggressor. Even so, all members of a coalition force should share relatively the same means of passive defense.<sup>32</sup>

Coalition cohesion depends in part upon the coalition partners or allies having the same ability to operate in NBC environments as US troops do. If they don't, the mission will be greatly degraded. Unequal passive defense impacts political and military decisions about involvement in conflicts. Quite possibly, the "coalition will not be sustainable if some members are more vulnerable to attack than others."<sup>33</sup> Civilians also should share in protections afforded by passive defense.

Chemical and biological weapons present formidable challenges to passive defenses: a "priority for enhancing counterproliferation capabilities is improved equipment to detect and characterize chemical weapons (CW) and biological weapons (BW), particularly at long ranges. The wide variety of chemical and biological agents calls for a variety of protective measures. Detection and characterization is one element of passive defense. Thus, the ability to detect and track CW and BW clouds, particularly at long ranges, provides additional early warning time for units at risk of attack."<sup>34</sup>

Current efforts to avoid contamination include developing sensors for joint task forces, developing mobile BW/CW reconnaissance systems, and developing systems capable of detecting multiple BW/CW agents and of characterizing new agents. In addition, technological advances may provide remote detection, miniaturization of current defensive technology, lower detection

limits, logistics supportability during contamination, and biological detection capability.<sup>35</sup>

Force protection efforts include improved mask systems; advanced protective clothing that reduces heat, stress, and the logistics burden; medical research (improved prophylaxes, antidotes, treatments, vaccines, medical casualty management systems); lightweight BW/CW protective shelters; and integrated collective protection technology.<sup>36</sup>

Decontamination capabilities may be improved through modular systems; sorbents, coatings, catalysis & physical removal; detection & warning sensors; individual and collective protection; medical response and general decontamination procedures.<sup>37</sup>

#### Conclusion

This study has identified ways to deter threats of WMD against the US through the counter-proliferation strategies of counterforce, active defense and passive defense. Counterproliferation strategies supplement and strengthen the credibility of the nonproliferation strategies of prevention, compellence, and deterrence.

Those nonproliferation strategies are much more attractive when they are supported by viable counterproliferation

strategies. In short, totally reliable counterproliferation renders WMD useless. And who wants useless (and sometimes very expensive weapons)? So effective counterproliferation greatly reduces the desire or need to acquire WMD. In a sense, counterproliferation strategies provide the foundation of the WMD policy. The international situation, politics, economics, and general national and global mindset determine what the nonproliferation strategies are. To a large extent, the success of nonproliferation strategies resides in the perceived "usefulness" of WMD.

This also applies to counterproliferation strategies. The same external factors (including civilian and coalition influences) impact their success. Maintaining credible, effective counterproliferation strategies and supporting them politically and economically is crucial to US national security. Monitoring and adjusting these strategies is a continuous challenge, as national and global conditions dictate.

Nonproliferation and counterproliferation strategies (like counterforce, active and passive defenses) mutually support each other. Nonproliferation strategies are designed to slow or stop proliferation, primarily by compelling or deterring (via policies, treaties, sanctions) as well as incorporating some aspects of protection. Counterproliferation strategies fall

wholly under the protection umbrella. But they can also lend effective support to nonproliferation.

If other governments realize the US has a defense - a very solid and effective set of counterproliferation strategies - and are willing and able to use WMD to the fullest against any government using or even threatening use of WMD, then that nation will be less likely to acquire and use WMD.

When nonproliferation strategies are not successful - that is, when nations persist in acquiring and using WMD - counterproliferation strategies must be up and running on a moment's notice. Actually, counterproliferation strategies work concurrently with nonproliferation strategies. Success or failure of one directly impacts the success or failure of the other. Counterforce, active and passive defense likewise work concurrently with one another.

Consider the counterforce strategy of targeting. If equipment, resources, and skills are lacking in this area alone, this single shortfall becomes a key degradation of mission accomplishment. All elements - from planning attacks to destroying or neutralizing NBC weapons - affect the mission. This in turn affects the active defense mission. The enemy/situation must be known in order for the active defense mission to succeed - that is, to prevent the weapon from reaching its target.

Counterforce and active and passive defense are interwoven and dependent upon each other. Examination of the components of counterforce and active defense reveals synonymous tasks: detecting and tracking and targeting, intercepting and interdicting, neutralizing, and destroying. Passive defense tasks parallel and support counterforce and active defense activities. Reconnaissance, detection and warning, avoidance of contamination all send the same message: a potential enemy will not surprise us, catch us off guard. Passive defense is important to active defense and counterforce because at all times US forces must prepare to operate and complete the mission, regardless of the situation. This capability involves continual training and development of protective measures, which in turn require ongoing economic and political support. There is no static passive defense.

Thus effective WMD strategy goes full circle. To be effective, the counterproliferation strategies must receive support politically and economically; yet to receive support politically and economically, they must continuously prove their utility and necessity.

This full circle image returns us to the challenges and shortcomings the US faces with respect to nonproliferation and counterproliferation. These include technology and acquisition, economics, advances of other nations and global dynamics. We

must finally face the ultimate question: Is the United States its own worst enemy?

A candid answer takes into account current policies regarding US interests, our national security, and our role in the world today. We are consistently spending less on defense and we are downsizing while maintaining requirements to answer potential multiple and simultaneous regional challenges. In other words, we say we are doing more with less. Yet we lack a viable missile defense system. We have an aging arsenal. We are sharing knowledge of technology and equipment with many nations. We have a historical tendency toward complacency, especially now that the Soviet threat is over. We have not precisely identified the current "threat." We tend not to know who our enemies are. Could it be that we indeed are our own worst enemy?

### Challenges

Future considerations for US policy-makers include managing the involvement of our commercial sector in creating technology and equipment for military and defense purposes. These considerations include national security, (lack of secrecy and control of knowledge, materials and other resources); brain-drain/technology drain to other countries, in particular, Third World countries; the potential for devious and covert use of this

knowledge and material; protecting ourselves against "enemy's" trained and equipped by the US; maintaining reliability in an aging stock of weapons; enforcing proliferation treaties and arms control agreements; maintaining US leadership in a changing global situation wherein the power of persuasion, diplomacy, and consensus-building exceed the traditional power of dollars and bullets.

Incidentally, another challenge, for the United States, are knowing (determining) who our friends are. Who can the US really trust? How do we determine who our coalition partners, allies, and friends are? Who should we share our technology and military knowledge with? What impact will these decisions have on our counterforce capabilities and WMD policy?

As US policy-makers forecast their vision for America for the next 5, 10, even 25 years, they must consider these issues. We must acknowledge that counterproliferation strategies alone (or with minimal and inconsistent backing) will not be conducive to a safe America. There must be complete understanding of the international, economic and technological trends taking place today. There must be acknowledgment of the ramifications of these trends for US WMD policy and ultimately for US security.

Endnotes

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<sup>19</sup> Ibid. 53.

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